

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
 (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P200200391 WO	<b>FOR FURTHER ACTION</b>	
	See Form PCT/PEA/416	
International application No. PCT/DK2004/000269	International filing date (day/month/year) 14.04.2004	Priority date (day/month/year) 15.04.2003
International Patent Classification (IPC) or national classification and IPC H04R5/027		
Applicant BRJEL & KJ R ET AL.		

<ol style="list-style-type: none"> <li>This report is the International preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</li> <li>This REPORT consists of a total of 4 sheets, including this cover sheet.</li> <li>This report is also accompanied by ANNEXES, comprising:           <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> <i>sent to the applicant and to the International Bureau</i> a total of 2 sheets, as follows:               <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> </li> <li><input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ol> </li> </ol>
<ol style="list-style-type: none"> <li>This report contains indications relating to the following items:           <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul> </li> </ol>

Date of submission of the demand 18.12.2004	Date of completion of this report 30.03.2005
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Leouffre, M Telephone No. +31 70 340-2944



# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/DK2004/000269

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

### Description, Pages

1-9 as originally filed

### Claims, Numbers

1-11 received on 20.12.2000 with letter of 15.12.2004

### Drawings, Sheets

1/2-2/2 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

- The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
- This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/DK2004/000269

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-11
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-11
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/DK2004/000269

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following document:

D1: Patent Abstracts of Japan

Vol.0030, no.61 (E-113), 26 May 1979 (1979-05-26)-& Jp-A-54 039601

(Hitachi Ltd), 27 March 1979 (1979-03-27)

Document D1 discloses a simulator in form of a dummy head (cf. title of japan abstract) including a microphone in the orifice of a simulated human ear (cf. abstract and figure 1 of original JP document) which measures an acoustic volume velocity through the orifice. The subject-matter of claim 1, respectively claim 6, differs from D1 in that the sound source is in the simulator. The subject-matter of these claims is therefore new (Article 33(2) PCT).

With this arrangement, the volume velocity of the output signal is easy to measure since only one sound source is required, and the arrangement of the measuring microphones is easily adaptable to any environment to be simulated. Therefore the present subject-matter is considered as involving an inventive step (Article 33(3) PCT)

Claims 2-5, respectively claims 7-11, are dependent on claim 1, respectively claim 6 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**Claims**

1. A method of determining the acoustical transfer impedance  $Z_t$  between a first position and a listening position of a human being, the method comprising

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- generating an acoustical volume velocity Q in the listening position,

- measuring a response quantity p at the first position resulting from the vol-

10      ume velocity Q, and

- determining the acoustical transfer impedance  $Z_t$  as the response quantity p divided by the acoustical volume velocity Q,  $Z_t = p/Q$ ,

15      characterized in that

the acoustical volume velocity Q is generated using a simulator (10) simulating acoustic properties of at least a head of a human being, the simulator comprising a simulated human ear (14, 15) with an orifice in the simulated

20      head and a sound source (30) for outputting the acoustical volume velocity Q through the orifice.

*Q in the simulator (10)*

2. A method according to claim 1, wherein the simulator simulates the head (13) and a torso (11) of a human being.

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3. A method according to claim 1, wherein the simulator comprises a sound source (30) in the interior of the simulator and a pair of microphones (M1, M2; M3, M4) arranged to measure a pair of sound pressures in a canal (18) leading from the sound source to the orifice, and that the method further comprises determining the volume velocity Q based on the pair of sound pressures.

4. A method according to claim 1, wherein the response quantity is sound pressure.
5. A method according to claim 1, wherein the response quantity is vibration velocity or vibration acceleration.
6. A simulator (10) for use with the method according to any one of claims 1-5 and simulating acoustic properties of at least a head of a human being, the simulator comprising a simulated human ear (14, 15) with an orifice in the simulated head and a sound source (30) for outputting the acoustical volume velocity Q through the orifice.  
*Q in the simulator (10)*
7. A simulator (10) according to claim 6, wherein the simulator simulates the head (13) and a torso (11) of a human being.
8. A simulator (10) according to any claim 6, wherein the simulator comprises two orifices simulating a left ear (14) and right ear (15) respectively of the simulated human being.
9. A simulator according to claim 8, wherein means (19) are provided for selectively outputting sound signals through the simulated left ear (14) or through the simulated right ear (15).
10. A simulator according to claim 6, wherein the simulator comprises means (M1, M2; M3, M4) for measuring the sound output from the simulated ears (14, 15).
11. A simulator according to claim 10, wherein the means for measuring the sound output from the simulated ears (14, 15) comprises a pair of microphones (M1, M2; M3, M4) for measuring the output sound volume velocity.